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If My Water Is Impaired What Do I Do?

Strategies You May Need To Take

There is a growing concern over the impairment of ground water from the use of pesticides and fertilizers. The impairment of ground water by these materials *may* affect crop productivity and the health of humans and animals.

Pesticides and fertilizers may enter ground water through both *direct* and *indirect* pathways. Direct entrance can occur from pesticide spills, improperly or poorly constructed wells, damaged well seals, back siphoning as a result of spray tank filling, chemigation, improper disposal and/or storage of pesticides and their containers. Pesticides can move through the soil and into the ground water. Mixing/loading areas, disposal sites and even normal pesticide and fertilizer applications may contribute to ground water impairment.

What's In Your Water?

When you turn on the tap, its not "just" water filling your glass. Water contains dissolved solids, usually minerals. Unfortunately, it may also contain organic compounds, live organisms or heavy metals. Human activities add many more substances to water. Some, such as bacteria come from waste products of people and animals. Others such as gasoline and industrial solvents are synthetic chemicals, made and used for special purposes. Still other materials occur naturally, such as nitrate and salt. Yet, human activities can greatly increase their concentrations in the environment. The contaminants most likely to show up in drinking water are the ones you are most familiar with— bacteria, nitrate, and common minerals such as iron and sulfur. If you are using a municipal water supply, chlorine may have been added for purification purposes and fluoride for its dental benefits.

Who To Contact

If you are concerned about the quality of your drinking water, your county extension agent or county sanitation personnel can be contacted for assistance. When pesticide or fertilizer impairment of ground water is suspected, the Montana Department of Health and Environmental Sciences and Montana Department of Agriculture should be contacted immediately. Discontinue use of the contaminated drinking water and use an alternative source of water such as bottled water.

Causes for Concern

A persistent or sudden onset of health problems that fail to improve with medical attention is a cause for concern. Changes in plant or crop productivity or animal health — which can not be attributed to other causes — and changes in the quality of drinking water may indicate a possible water quality problem.

Changes in appearance, taste or odor of drinking water may be caused by:

- bacterial impairment
- salinity or alkalinity problems
- organic solvents
- sewage and
- a host of naturally occurring minerals such as iron, selenium and sulfur.

A change in the *appearance, taste or odor* of your drinking water may indicate ground water impairment. Your county extension agent or county sanitarian can suggest water treatment options that may be used to correct the quality of your drinking water.

Water Samples

Water samples must be collected and analyzed to determine if ground water has been contaminated. A well owner can contact the Montana Department of Health and Environmental Sciences Chemistry Laboratory, Montana State University Analytical Laboratory, Montana Bureau of Mines and Geology Analytical Laboratory, or any public or private laboratory for assistance in obtaining:

- the appropriate water sample bottle
- necessary chemical preservative
- instructions on how, when, and where to collect a water sample

The customer should always feel free to shop around (*but cheapest is not always best*). Seven important questions to ask when contacting a laboratory for water testing services are:

1. Are sample bottles (containing preservatives if necessary) provided?
2. Are recommended sampling procedures provided?
3. Do they use Environmental Protection Agency approved methods?
4. Does the laboratory provide water sample collection instructions?
5. What is the scope of analytical services provided: type(s) of tests which can be done, how will test results be reported (results should indicate whether a presence was detected and for positive detections a numerical value should be listed (i.e., 10 parts per million)), will health standards or parameters be given for each analyzed constituent?
6. Will the results be interpreted and explained in a manner that is easily understandable and will recommendations be given?
7. What is the turn-around time from arrival to reporting of results?

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Water Sample Analysis

Preservation and transportation of the water sample within the designated holding time are critical to ensure sample integrity. Water sample collection instructions must be followed carefully. Analyses that could be conducted on water samples include the:

- presence of coliform and/or fecal coliform
- concentration level of inorganics (i.e., nitrates and sulfur)
- presence of a specific chemical or family of pesticides (i.e., phenoxy herbicides)

Fees Charged

Fees charged for water quality analyses are dependent upon the laboratory and analysis chosen. The time required for test results to be completed and returned will vary from a few days to several weeks, depending upon the laboratory and the analysis. Testing for pesticides is more complex and more expensive than routine tests used to detect minerals and bacteria. Therefore, attempts should first be made to rule out other sources of impairment.

Suspicious of Impairment?

If pesticides or fertilizers are suspected as the source of ground water impairment, both the Montana Department of Health and Environmental Sciences and the Montana Department of Agriculture should be contacted immediately! If the water quality analysis results indicates a well is contaminated by pesticides or fertilizers, the source of the impairment should be identified and contained if possible. To determine if the detection is a threat to health, consult maximum contaminant levels and health advisory levels (obtain from the Montana Department of Health and Environmental Sciences or refer to Fertilizer Fact *Sheet 94-15*). Depending on the contaminant concentration level in the well water, continued use of bottled water is recommended until a treatment method is chosen and *implemented.* Connection to a public drinking water supply system (if available or accessible in the area) may be an option for some private well owners. Public drinking water supply systems undergo stringent monitoring and must meet Safe Drinking Water Standards. Another option may be to drill a new well in an area that is free from ground water impairment. In most cases the new well should be uphill from and as far from the contaminated well as possible. Technical assistance with well siting may be desirable.

Ground Water Investigation

The Montana Department of Health and Environmental Science Water Quality Bureau and the Montana Department of Agriculture are authorized to conduct the ground water investigations necessary to determine the cause and extent of ground water impairment. Prompt notification expedites the identification of the contaminant and development of a remediation plan to cleanup the ground water. With early detection, it may minimize the extent of impairment and prompt mitigation activities.

Steps To Prevent Water Impairment

Private well water contamination can occur anywhere, but some areas are more vulnerable than others. A great deal depends on the particular combination of land uses and natural features.

- ✓ In most cases, soil serves as an adequate filter. Water seeps slowly through tiny pore spaces in soil, allowing time for contaminants to break down into less harmful substances.
- ✓ Coarse, sandy soils do not always adequately protect ground water because water drains through the soil pores too quickly.
- ✓ In areas where the water table is close to the surface, contaminants can leach into ground water too quickly, before they have time to decompose into harmless substances.
- ✓ In some areas, thin soil overlays fractured bedrock such as limestone or dolomite, or the bedrock is found at the land surface. In these areas, contaminants can enter ground water quickly through the cracks or fissures in the rock.
- ✓ Characteristics of an individual contaminant help determine how likely it is to leach into ground water. Some substances stick to soil particles and remain in the upper soil layers. Some substances, such as aldicarb and nitrate, are highly soluble in water and readily move down through the soil with water.
- ✓ If you are installing a new well, make sure it is upgradient from land uses that may contaminate it. Ground water flow generally follows the surface contours of the land. Some potential sources of contamination include septic tanks, feedlots, landfills and pesticide and fertilizer storage sites.
- ✓ Make sure an existing well is properly sealed. Bacteria often contaminate improperly sealed wells.
- ✓ Test water annually— twice a year in higher risk areas— for nitrate and bacteria.
- ✓ Make sure your septic tank and drain field operate properly. Have the tank pumped every two years.
- ✓ Never dispose of substances such as motor oil, paint, solvents, fertilizers and pesticides in a septic system.
- ✓ Be aware of local land uses beyond your backyard. Local well problems usually originate from local sources.
- ✓ Conduct a Farm*A*Syst assessment.
- ✓ Take reasonable precautions around your home and get involved in local land use decisions to reduce the risks of contaminated well, ground and surface water.

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The programs of the Montana Extension Service are available to all people regardless of race, creed, color, sex or national origin.

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